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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/748,473

12/30/2003

Richard D. Breault

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7083

7590

06/20/2006

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EXAMINER

YUAN, DAH WEI D

ART UNIT

PAPER NUMBER

1745

DATE MAILED: 06/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/748,473

Applicant(s)

BREAULT, RICHARD D.

Examiner

Dah-Wei D. Yuan

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DIRECT ANTIFREEZE COOLED FUEL CELL POWER PLANT
WITH PASSIVE WATER MANAGEMENT

Examiner: Yuan

S.N. 10/748,473

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June 15, 2006

Detailed Action

1. The Applicant's Request for Reconsideration filed on April 28, 2006 was received.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on January 25, 2006.

Claim Rejections - 35 USC § 103

3. The claim rejections under 35 U.S.C. 103 (a) as being unpatentable over Condit et al. (US 6,419,891 B1) in view of Breault et al. (US 6,461,753 B1) on claims 1-4,6,7 are maintained. The rejection is repeated below for convenience.

With respect to claim 1, Condit et al. teach a fuel cell power plant for generating power comprising at least one fuel cell having an electrolyte (62), an anode catalyst (64), a cathode catalyst (66), an anode support means, a cathode support means, a porous anode water transport plate (68) (anode cooler plate), an antifreeze solution, a porous cathode water transport plate (74) (cathode water management plate), and water transport plates (separator plate) that are adjacent to the porous anode and cathode water transport plates and from a network of coolant channels for delivering the coolant to the water transport plates. See Column 9, Line 10 to Column 10, Line 18. However, Condit et al. do not teach or suggest the addition of a pressure control means for maintaining a positive pressure differential between the fuel stream and the antifreeze stream.

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Breault et al. teach a fuel cell that uses an antifreeze solution to remove heat from the fuel cell. The fuel cell further include a pressure control means in fluid communication with cooler plate for maintaining a positive pressure differential between the process oxidant and reducing fluid reactant streams passing through the fuel cell within the anode and cathode flow fields. See Column 5, Lines 13-65. Therefore, it would have been obvious to one of ordinary skill in the art to include a pressure control means onto the fuel cell power plant of Condit, because Breault et al. teach the use of such pressure control means to maintain a positive pressure differential between the process oxidant and reduce the fluid reactant streams passing through the fuel cell.

With respect to claim 2, Condit et al. teach the fuel cell power plant further comprising a coolant feed line (38) and a coolant discharge line (40), a coolant pump (42), a coolant heat exchanger (44) (radiator), an oxidant saturator (172) (coolant evaporator). See Figures 1 and 3, Column 8, Lines 1-26; Column 15, Line 52 to Column 16, Line 31.

With respect to claim 3, Condit et al. teach the fuel cell power plant further comprising an oxidant discharge line (40), an oxidant recycle line (48) and an oxidant saturator (172) (coolant evaporator). See Column 8, Lines 1-26.

With respect to claim 4, Condit et al. teach the fuel cell power plat further comprising a coolant channels (90) (water management channel) defined within the cathode water transport plate (74) (cathode water management plate) to extend between the coolant heat exchanger (a condensation zone) to the oxidant saturator (an evaporation zone). See Column 9, Line 61 to Column 10, Line 18.

With respect to claim 6, Condit et al. teach the fuel cell power plant further comprising a plurality of fuel cells to form a cell stack assembly enclosed within a frame structure. See Column 8, Line 62 to Column 9, Line 8. The fuel cell power plant further comprises water support plates (separator plate) that are adjacent to the porous anode and cathode water transport plates and from a network of coolant channels for delivering the coolant to the water transport plates as shown in Figure 2 of Breault et al.

With respect to claim 7, Condit et al. teach the cathode support means may be wetproofed depending on performance requirements of the cell. See Column 9, Lines 30-45.

4. The claim rejections under 35 U.S.C. 103 (a) as being unpatentable over Condit et al. (US 6,419,891 B1) and Breault et al. (US 6,461,753 B1) as applied to claims 1-4,6,7 above, and further in view of Breault et al. (US 6,416,892 B1) on claim 5 are maintained. The rejection is repeated below for convenience.

Condit et al. and Breault et al. disclose a fuel cell power plant as described above in Paragraph 3. However, Condit et al. and Breault et al. do not disclose the use of a cooler plate peripheral edge seal. Breault ('892) teach the use of edge seals (106,108) to restrict the movement of the process oxidant or exhaust stream through the perimeter of the porous body. See Column 10, Lines 1-62. Therefore, it would have been obvious to one of ordinary skill in the art to add a cooler plate peripheral edge seal between the anode cooler plate and the separator plate, an edge seal between the separator plate and the anode support means and an edge seal

disclosed by Breault ('892), because Breault teach the use of edge seal to restrict the movement of the fluid through the perimeter of the porous body in the fuel cell system.

Response to Arguments

5. Applicant's arguments filed on April 28, 2006 have been fully considered but they are not persuasive.

Applicant's principle arguments are

Condi reference does not teach a separator plate secured adjacent the coolant channels of the anode cooler plate for prohibiting movement of the direct antifreeze solution through the separator plate.

In response to Applicant's arguments, please consider the following comments.

Condi et al. teach the porous anode and cathode water transport plate (68,70) may be structured to cooperate with adjacent water transport plates (not shown) (emphasis added) so that anode side coolant channels defined within the anode water transport plate and cathode side coolant channels defined within the cathode water transport plate may cooperate in mirror-image association with coolant channels of the adjacent water transport plates of adjacent fuel cells to form a network of coolant channels for delivering a cooling fluid stream to the water transport plates. See Column 10, Lines 1-18. The water transport plate adjacent to the anode water transport plate is considered to be a separator plate that does not allow the passage of antifreeze solution through the plate. Clearly, the coolant channels (88A,88B,88C) are used to transport the

antifreeze and, therefore, the transport plates surrounding the coolant channels would have to restrict the movement of the liquid coolant through the water transport plate. This is further supported by the disclosure by Condi that the cooling fluid stream passes into the coolant discharge line (40) once the pore volumes of the water transport plates are saturated with the cooling fluid, i.e., the movement of the direct antifreeze solution is prohibited through the water transport plates. See Column 10, Lines 19-38. It is also noted that the impervious nature of the separator plate (36) in the instant specification is not recited in the independent claim. The claim rejections under 35 U.S.C. 103 (a) as being unpatentable over Condit et al. in view of Breault et al. (US 6,461,753 B1) are deemed proper and thus are maintained.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (571) 272-1295. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dah-Wei D. Yuan
June 15, 2006



DAH-WEI YUAN
PRIMARY EXAMINER